
Plastics & Environment – An Introduction

Hong Kong Green Council

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Agenda

- History and background
- Some Facts about Plastics
- Plastics Identification Codes
- Biodegradable Plastics

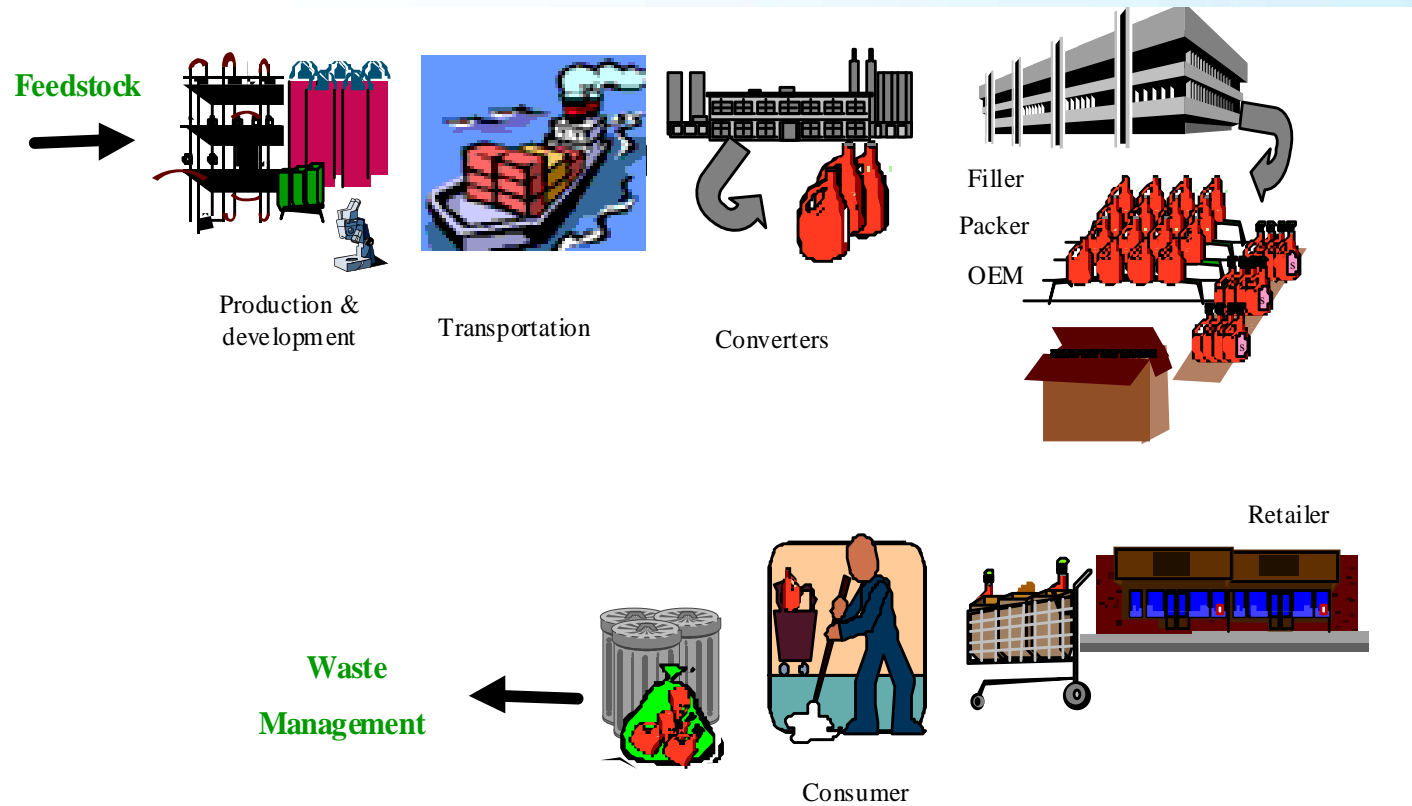
Plastics Issues Council

- Plastics Issues Council (PIC) is a sector committee of the Association of International Chemical Manufacturers Ltd, (AICM).
- The Council represents the interests of its members and works to manage common plastics-related issues in Mainland China and Hong Kong SAR

History of Plastics

- 1907 – Leo Hendrik Baekeland invented the first man-made resin, and called it Bakelite. It could be heated and moulded into any shape but only once.

Plastics Value Chain



Some Facts About Plastics

- Plastics consume only a tiny fraction – just 4% - of the world's oil, as feedstock.



Some Facts About Plastics

- Plastics are one of the most resource efficient and versatile materials.

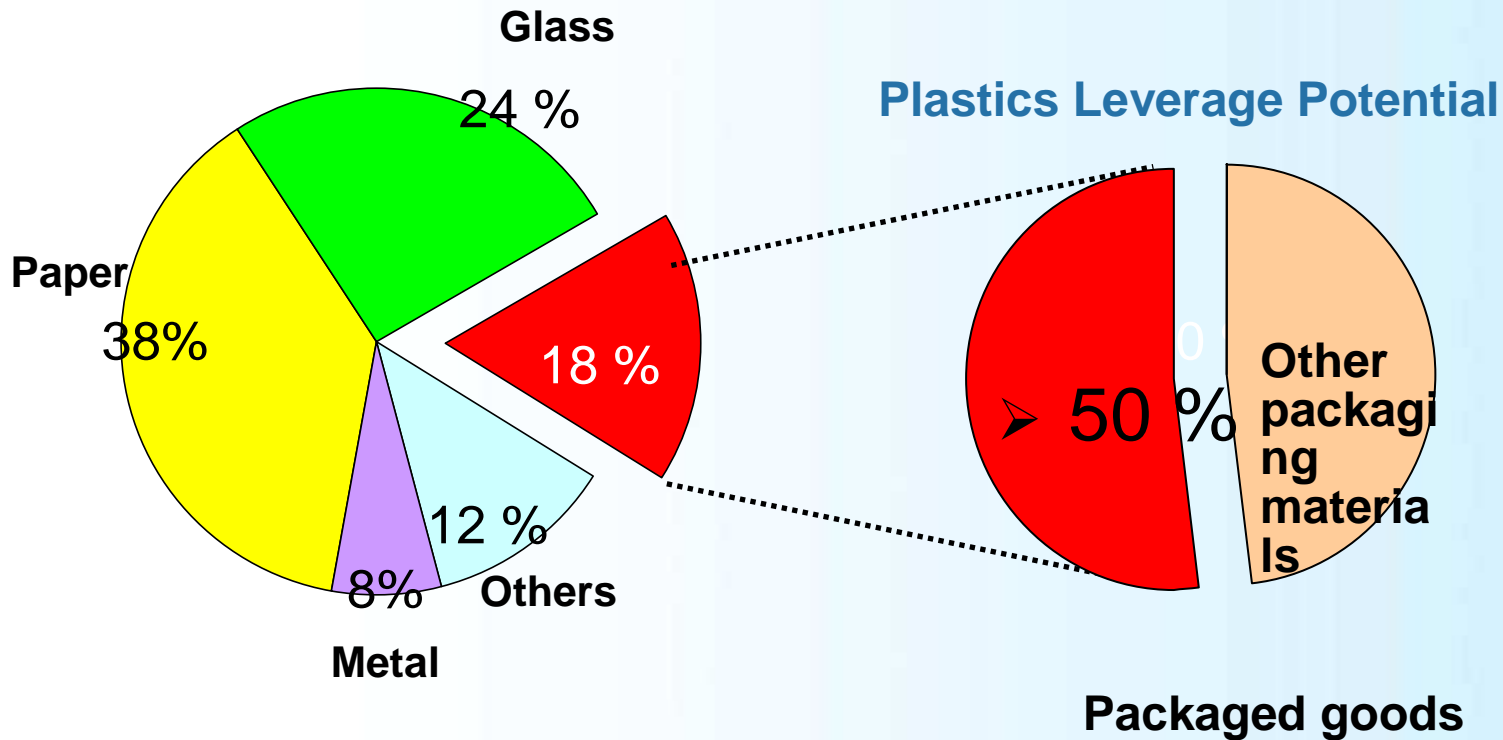


Some Facts About Plastics

- Plastics make our lives safer : airbags, seatbelts, baby seats, bike helmets, medical devices...are just some examples
- Plastics can preserve and distribute water economically, reliably and safely.
- Plastics help to protect and preserve food, reduce food waste.



Some Facts About Plastics



Weight % of packaging materials in Europe

Plastics Packaging: Light Weight Champion



Source: TN SOFRES 2000 / PL.EUR



Some Facts About Plastics

- Plastics make a significant contribution to the vital goals of **Sustainable Development** :
 - Social progress : plastics provide affordable products in everyday living
 - Economic Development : the plastics industry and downstream industries are major employers
 - Environmental Protection : plastics help to save resources – fossil fuels and energy. Plastic products save water and food

Some Facts About Plastics

- Plastics products in use save oil and energy :
 - plastics in cars reduce oil consumption, reducing CO2 emissions
 - Plastics help reduce energy consumption in our homes
 - Plastics are used in solar panels, wind turbines

Environmental Considerations

- Life Cycle Analysis : Cradle to Grave
 - energy (and other resources like water) consumption during production, processing, transportation and in use
 - green house gas emission
 - Total material quantity (volume, weight)
 - End Of Life, Waste Management (recycle, biodegradability, energy recovery.....)



LCA : assess alternative materials

- All materials & products consume energy resources
 - Feedstock & production energy, energy for use-phase
 - Materials can frequently save energy resources
 - Less production energy than alternatives
 - Less energy demand in the use phase
 - Energy recovery possible in waste management
- Study the net-effects of the use of plastic products on energy demand and greenhouse gas (GHG) emissions during total lifetime, compared to the use of alternative materials

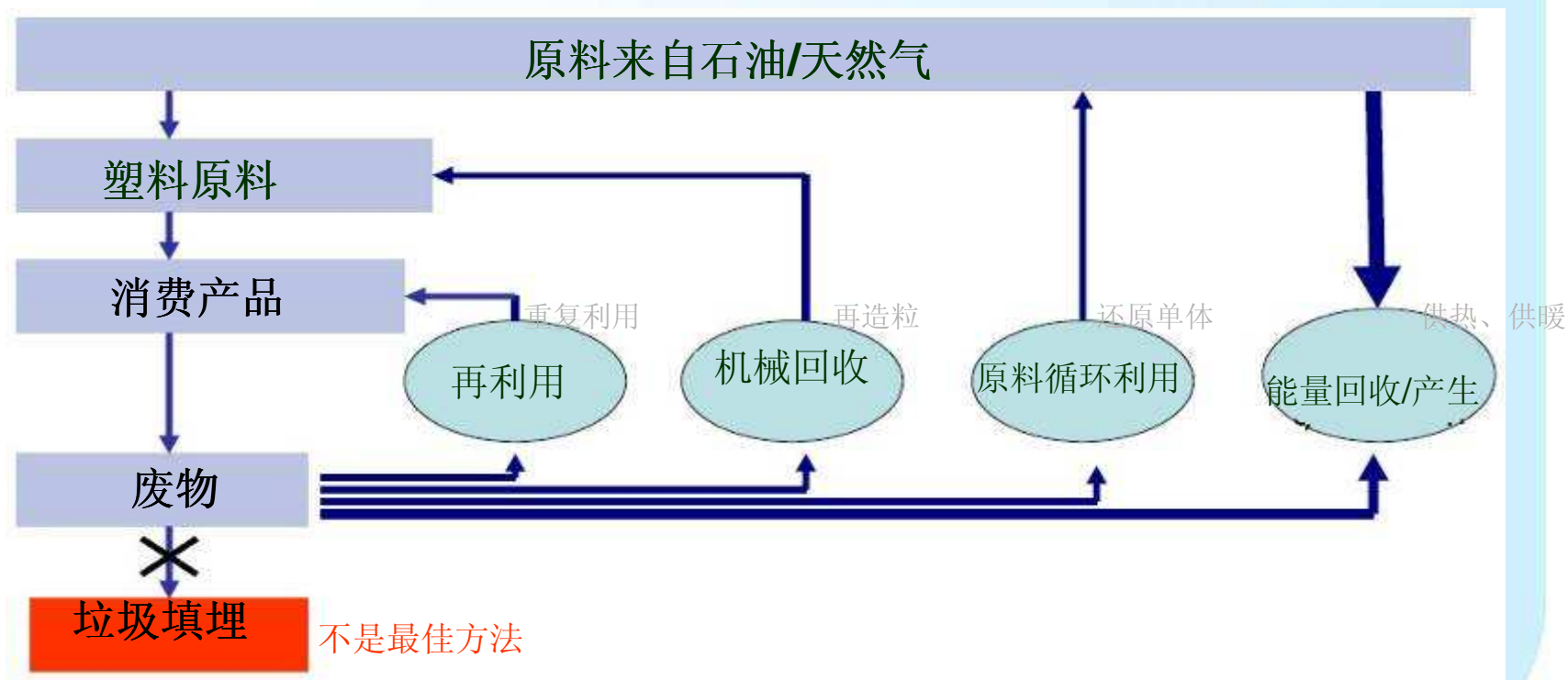
Some Facts About Plastics

- Plastics are too valuable to waste – even at end-of-life. After serving a useful purpose, plastics can either be recycled or used as an alternative fuel (energy recovery). Plastic waste has a calorific value at least equal to coal and with lower CO₂ emissions !

Environmental Considerations

- 4R : Reduce, Recycle, Reuse, Recovery

Plastics – Reuse, Recycle, Recovery



Environmental Considerations

Innovation & Design : Within a Decade :



- Margarine containers reduced by 27% in weight



- Dairy containers reduced 13% in weight

Environmental Considerations Product

Design, Innovation : Plastics Money in Hong Kong !



SPI Resin Identification Codes

- Most plastics can be recycled by mechanical means (melting and pelletising) for reuse.
- In 1988, Society of Plastics Industry in US developed Codes to facilitate sorting and recycling of Post Consumer Plastics

<http://www.plasticsindustry.org/outreach/recycling/2124.htm>



SPI Resin Identification Codes

- The overwhelming majority of plastic packaging is made with one of six resins: polyethylene terephthalate (PETE); high density polyethylene (HDPE); polyvinyl chloride (PVC or vinyl); low density polyethylene (LDPE); polypropylene (PP); or polystyrene (PS). The SPI resin identification code assigns each of these resins a number from 1 to 6.
- The SPI coding system also includes a seventh code, identified as "other." Use of this code indicates that the product in question is made with a resin other than the six listed above, or is made of more than one resin used in combination.

HP Recycled Plastics in Ink Cartridges

- Since 2005, HP has manufactured more than 200 million inkjet cartridges with recycled content. By turning old HP cartridges into new ones, the company says it has diverted about 8.8 million pounds of recyclable plastic from landfills.

HP's recycling process allows the company to produce ink cartridges made up of 70 to 100 percent recycled content.

Last year HP used more than 5 million pounds of different types of recycled plastic in manufacturing inkjet cartridges. The company plans to double the amount of recycled content used this year.



Recycled PET -> T Shirts

- Wal-Mart Stores plans to begin selling a line of Coca-Cola-branded T-shirts that are partially made from recycled plastic bottles



http://www.ajc.com/business/content/business/stories/2008/04/02/cokeshirts_0403.html

Biodegradable Plastics Considerations

- Biodegradability is one of the functional properties of plastic articles
- Bio-based = Biodegradable ?
- International Standards : ISO17088 or EN13432
- Material selection based on Life Cycle Analysis : it is not correct to assume that Biodegradable plastics are *more environmentally friendly*.

Biodegradable Plastics Considerations

- Biological degradation will take place under the required conditions : micro-organisms, temperature and humidity as existing in industrial composting plants
- Landfilling of untreated biodegradable materials under anaerobic conditions could increase methane emissions that may have climate change effects

Biodegradable Plastics Considerations

- Stakeholders must take into consideration the following :
 - Ensure that biodegradable plastics will be separated from the waste stream for sending to composting facilities
 - Ensure the material actually biodegrades under suitable conditions

Finally

- Littering is a behavioral problem !

Useful websites

- www.factsonplastic.com
- www.plasticsindustry.org
- www.plasticseurope.org

Plastics Issues Council

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Thank you for your attention !